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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,000	01/17/2007	Hiroyuki Kanbara	36856.1455	1561

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MURATA MANUFACTURING COMPANY, LTD.  
C/O KEATING & BENNETT, LLP  
8180 GREENSBORO DRIVE  
SUITE 850  
MCLEAN, VA 22102

EXAMINER
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EOFF, ANCA

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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04/02/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

JKEATING@KBIPLAW.COM  
uspto@kbiplaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/596,000	<b>Applicant(s)</b> KANBARA ET AL.	
	<b>Examiner</b> ANCA EOFF	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 08 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 20-29 and 31-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-29 and 31-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. The foreign priority document JP 2003-393551 filed on November 25, 2003 was received and acknowledged. However, in order to benefit of the earlier filing date, a certified English translation is required.
2. Claims 20-29 and 31-36 are pending in the application. Claims 1-19 and 30 are canceled.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:  

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
4. Claims 21 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 21 and 32 refer to the contents of inorganic powder, photosensitive monomer and photopolymerization initiator in the photosensitive paste of claims 20 and 31. The range of the each component is given in "percent by weight" but it is not specified what the percent by weight is based on: total amount of inorganic powder, photosensitive monomer and photopolymerization initiator or total amount of components of the photosensitive paste.

For examination purpose, the "percent by weight" was considered as based on total amount of inorganic powder, photosensitive monomer and photopolymerization initiator in the photosensitive paste.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 20, 22-24, 26-27, 29, 31 and 33-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US Pg-Pub 2002/0160313).

With regard to claims 20 and 31, Park et al. disclose a photopolymerization type photosensitive paste comprising:

- a water-soluble polymer, such as cellulose derivatives or copolymers containing water-soluble monomers (par.0022);
- monomers or oligomers (par.0023);
- a photoinitiator (par.0024), and
- an inorganic fluorescent material (par.0025), in form of powder (par. 0007).

In Examples 1 and 2 (table 2, par.0036), Park et al. show photosensitive paste compositions comprising:

- HEC (hydroxyethyl cellulose) or HPC (hydroxypropyl cellulose) as binders;
- pentaerythritol triacrylate (PETA) as multifunctional monomer and 2-hydroxyethyl acrylate (HEA) as single functional monomer;
- HSP-188 as UV ray photoinitiator and
- fluorescent material.

In Examples 1 and 2, the ratio (photosensitive monomers) /(photosensitive monomers+polymeric binder) is about 0.833.

The polymeric binder could be comprised in the photosensitive paste composition in an amount 1-15% (par.0032) and the Examples 1, 2 show an amount of polymeric binder of 3%. By further reducing the amount of polymeric binder within the limits indicated by Park et al., the limitation regarding the ratio required by the instant application is met.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05-II.B)

Park et al. further disclose a method of forming a fluorescent film using the photopolymerization type photosensitive paste, said method comprising the following steps:

- preparing the photosensitive paste composition;
- coating the composition on a glass substrate;
- exposing the dried composition, and
- developing with pure water to form a fluorescent film (par.0013).

With regard to claims 22 and 33, Park et al. further disclose that the photopolymerization type photosensitive paste may comprise monomers having a

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double bond concentration within the range of about 8 mmol/g to about 11 mmol/g, such as dipentaerythritol hexaacrylate (par.0023).

With regard to claims 23 and 34, Park et al. further disclose that the photopolymerization type photosensitive paste may comprise monomers having an ethylene oxide structure with a degree of polymerization of about 3 or less, such as ethyleneglycol diacrylate, methyleneglycol bisacrylate (par.0023).

With regard to claims 24 and 35, Park et al. further disclose that the photopolymerization type photosensitive paste may comprise a hydroquinone-type UV stabilizer (par.0027) , equivalent to the ultraviolet absorber of the instant application.

With regard to claim 26, Park et al. disclose that the development is performed with pure water (par.0032).

Park et al. further disclose that the binder polymer used in the photopolymerization type photosensitive paste is preferably soluble in both water and organic solvents, more preferably soluble in water in order to use pure water as development liquid in view of cost, working environment and environmental pollution (par.0030).

While Park et al. do not specifically disclose a solvent used as development liquid, one of ordinary skill in the art would have the motivation to use a solvent as development fluid in order to dissolve and remove the binder, if a solvent-soluble binder is present in the composition of the photopolymerizable paste.

With regard to claim 27, Park et al. disclose an exposing step, which consists in aligning the mask and exposing the dried paste to radiation (par.0032). It is examiner's

position that the exposure step does not involve any contacting of the paste film with the photomask.

With regard to claim 29, Park et al. further disclose that the thick film pattern is baked at 450-550°C (par.0032), equivalent to the firing step of the instant application.

7. Claims 21 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US Pg-Pub 2002/0160313) in view of Frechet et al. (US patent 5,648,196).

With regard to claims 21 and 32, Park et al. render obvious the process of claim 20 and the composition of claim 31 (see paragraph 6 of the Office Action) and the photopolymerization type photosensitive paste of Park et al comprises:

- 73 % by weight of fluorescent material, equivalent to the inorganic powder of the instant application;
- 24% of monomers (PETA, HEA), and
- 0.024 % of photopolymerization initiator (HSP-188) (Example 2 in table, par.0036), based on the total amount of florescent material, monomers and photopolymerization initiator.

The amount of photopolymerization initiator of park et al. is not in the range required by the instant application.

However, it is well-known in the art that by increasing the amount of photopolymerization initiator/photoinitiator, the sensitivity of the photopolymerizable composition increases, as evidenced by Frechet et al. (column 12, lines 15-18 and

fig.2). The amount of photopolymerization initiator/photoinitiator in a photopolymerizable composition is a result-effective variable, having influence over the sensitivity of the composition and therefore it may be optimized.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result-effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05-II.B)

It would have been obvious to one of ordinary skill in the art at the time of the invention to increase the amount of photopolymerization initiator in the composition of Park et al., in order to increase the sensitivity of the photopolymerizable paste.

8. Claims 25 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US Pg-Pub 2002/0160313) in view of Crary (US Patent 3,661,576).

With regard to claims 25 and 36, Park et al. render obvious the process of claim 20 and the composition of claim 31 (see paragraph 6 of the Office Action) but fail to disclose that the amount of solvent in the photopolymerization type photosensitive paste is about 5% by weight or less.

The amount of solvent in the composition of Park et al. is in the range 20-35 wt.% (par.0021).



However, it is well-known in the art that the amount of solvent added to a photopolymerizable composition can be varied widely in accordance to the viscosity desired for the particular coating method by which the compositions are applied to substrates and films , as evidenced by Crary (column 12, lines 6-10). The amount of solvent in a composition is a result-effective variable, having influence over the viscosity of the composition and therefore it may be optimized.

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) (The claimed wastewater treatment device had a tank volume to contractor area of 0.12 gal./sq. ft. The prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio, and therefore the parameter optimized was not recognized in the art to be a result- effective variable.). See also *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) (prior art suggested proportional balancing to achieve desired results in the formation of an alloy). (MPEP 2144.05-II.B)

It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the amount of solvent added to the paste of Park et al., in order to optimize the viscosity of the paste for coating.

9. Claim 28 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al. (US Pg-Pub 2002/0160313) in view of Iguchi et al. (US Patent 6,197,480)

With regard to claim 28, Park et al. render obvious the process of claim 20 (see paragraph 6 of the Office Action), wherein in the exposure is performed with UV light and a mask (par.0032) but fail to disclose that the exposure may be performed without using a photomask.

Iguchi et al. disclose a photosensitive paste including inorganic particles and an organic components and a method of producing a plasma display using said composition (abstract)

The process of Iguchi et al. comprises the following steps:

- applying the paste to a film (column 12, line 37);
- exposing the paste, preferably with UV light (column 12, lines 45-62);

The exposure can be done with a mask of negative or positive type (column 12, lines 48-49), or direct pattern formation by means of a red or blue visible laser beam or Ar ion laser beam may be performed instead of using the mask (column 12, lines 51-53).

- developing the making use of the difference in solubility to developing solution between the exposed and the unexposed portions (column 13, lines 25-27);
- firing the pattern (column 13, line 55).

Due to the fact that the patterning process of Park and Iguchi are directed to a photosensitive paste and are used for producing plasma display devices/panels, it would have been obvious to one of ordinary skill in the art at the time of the invention to perform the exposure step of the process of Park et al. by direct pattern formation as disclosed by Iguchi et al., with a reasonable expectation of success.

### ***Response to Arguments***

10. Applicant's arguments filed on January 08, 2008 have been fully considered but they are not persuasive.

On page 3 of the Remarks, the applicant cites the rejection of claim 20 of the previous Office Action and argues that Park et al. teach that the polymeric binder could be comprised in the photosensitive paste composition in an amount of 1-15% but fail to teach or suggest a ratio of photosensitive monomer to polymeric binder other than the ratios in table 1.

On page 4 of the Remarks, the applicant argues that Park et al. disclose in Examples 1 and 2 a ratio (photosensitive monomers)/(photosensitive monomers + polymeric binder) of about 0.833 and this is the upper limit of this ratio. Examples 3 and 4 show a ratio clearly below 0.8333.

The applicant concludes that "the maximum value of the ratio (photosensitive monomers)/(photosensitive monomers + polymeric binder) of Park et al. is about 0.8333".

Furthermore, the applicant cites from par.0029 of Park et al. "The role of the binder polymer which acts as a binder of the fluorescent material is very important in the photopolymerization type photosensitive paste of the present invention". The applicant further uses par.0029 of Park et al. to conclude that one of ordinary skill in the art would not have been motivated to further reduce the amount of binder below the amount disclosed in Examples 1 and 2 because the existence of the binder is very important to the invention.

However, the applicant would like to show that Park et al. clearly disclose that the amount of binder polymer in the photosensitive paste may be between 1 and 15 wt %

(par.0032) so one of ordinary skill in the art would have the motivation to vary the amount of binder within this range.

The amount of binder in Examples 1 and 2 is around 3% (table 1, par.0036). By further reducing the amount of polymeric binder within the limits indicated by Park et al. (1-15 wt%), the limitation of the instant application regarding the (photosensitive monomers)/(photosensitive monomers + polymeric binder) ratio is met.

The examiner would also like to point out to par.0037 of Park et al. which shows that a smaller amount of binder leads to minimized residual binder after baking. Therefore, one of ordinary skill in the art would have the motivation to use small amounts of binder within the range of Park et al., in order to minimize the amount of residual binder after baking.

### ***Conclusion***

11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anca Eoff whose telephone number is 571-272-9810. The examiner can normally be reached on Monday-Friday, 6:30 AM-4:00 PM, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/A. E./

Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795